

**ABSTRACT**

Data at a transmitter is modulated, in accordance with instructions from a receiver, to provide M different modulations in successive sequences. N spreading codes are also provided in successive sequences at the transmitter, in accordance with instructions from the receiver, alternately with the M data modulations. The alternate sequences of the M data modulations and the N spreading codes are paired and individual ones of the M data modulations and the N spreading codes in the paired sequences are combined (e.g. multiplied). Alternatively, an individual one of the M data modulations is combined (e.g. multiplied) with an individual one of the N spreading codes in the adjacent sequence. The modulator and the spreader may be included at the transmitter with (a) a channel encoder which provides channel coding in accordance with instructions from the receiver, (b) a puncturer which removes particular data in accordance with instructions from the receiver and (c) an interleaver. The paired combinations of the individual ones of the M data modulations and the N spreading codes are transmitted to the receiver, which uses correlation or matched filter techniques to recover each combination of the individual one of the data modulations and the individual one of the spreading codes. The recovered data is de-spread in accordance with instructions from the receiver, demodulated in accordance with instructions from the receiver and de-interleaved. The particular data punctured from the sequence is re-inserted and the data is then decoded in accordance with the instructions from the receiver.